

Mathematical Girls - Fermat's Last Theorem

C06

DKThias Scanslations
Eastern Aether
Norway Scan
Forgotten Scans

Raw provider : DKThias
Translator : Kaiyaku
Proofreader : Vowndum
Cleaner : DKThias
Redrawer : flowersofmoe
Typesetter : Bokoi
Quality checkers : Vowndum
Sakuseki
DKThias
Flowersofmoe

#DKThias @icrizon.net
#Pocketoli @icrizonwayner
#Forgotten-Scans @icrizonwayner
Eastern Aether

dkthias.com

los-scans.com

easternatheta.wordpress.com



Chapter 6

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6

話

HOW
IS YOUR
FOOT?

WELL,
IT'S NOT
SO BAD I
O-LE-LE.

THEY JUST
CRACKED IT UP
A LITTLE AND
GAVE MY
HEEL SOME

REALITY

WHAT WAS
SHREKASANT
WAS PROBABLY
THE VIBRATIONS
WHEN THEY
SHAKED THE
BONES OF MY
FOOT

SHREKASANT

I CAN
STILL HEAR
THE SCREAMING
SCREAMS
FROM MY
HEEL...

OH—

IT WASN'T
SUCH A BIG
OPERATION
AFTER ALL...

ENOUGH!
I GET IT!

swing

swing



STOP!!

ALL RIGHT
WE WILL BE
GOING HOME
SOON!



OH HEAV!

BY THE WAY,
ONE-CHAN...



I'LL BE COMING
BACK WITH
ONE-CHAN



IT CAN'T
BE HELPED

Sigh~



IN THAT
CASE,
SHALL I
LEAVE
THIS TO
YOU?

UNDER-
STOOD.



WHAT ARE YOU
SUSPECTING
ARE
YOU PLANNING
TO WALK BACK
ON DUTCHES?

IT'S FINE,
REALLY?
IT'LL BE
FOR MY
REHAB?



ARE YOU
DRIFT?



IT'S
FINE



BUY
SOMETHING
LIKE THAT
IS TOTALLY
FINE

I WANT
YOU TO THINK
WE MATCH
THAT WAD IS

UHH...

...YEAH,
WELL...



NOW THAT
I REMEMBER,
WEREN'T YOU
TRYING TO BUY
SOMETHING A
WHILE AGO?



SO I WAS
THINKING IT DO
UNDERSTAND
THAT MUCH...

I EVEN
LEARNED
ABOUT THE
"GREATEST
COMMON
DIVISOR" IN
SCHOOL...

BUT I'VE
STARTED TO
FEEL THAT I
ACTUALLY
DON'T...

TAP

TAP



WELL,
YOU'VE
SEEN
THE OTHER
ONE,

WHEN ONE-CHAN
SPOKE HE "WAS"
PROBABLY OF THE
NUMBER OF STEPS
GAVE A COMPLETE
PATRIOT,

YOU WANT
ABLE TO JAMMER
IMMEDIATELY



YOU
WANTS
TO STUDY
MORE.

ONE-CHAN



FOR
EXAMPLE,
MULTIPLES

THE
MULTIPLES
OF 2 IN THE
NATURAL
NUMBERS,
WE CAN SAY
ARE 2, 4, 6,
8, 10...

NO,
ABSOL-
UTELY
NOT.



DO
THAT
GUY?

NEAR

DO IT
BROOD?



IF THAT WAS
EVERYTHING IT
WOULD HAVE
BEEN SIMPLE,
BUT THERE'S
ALSO MORE
DEPTH TO IT.

IF WE THINK
FOR A BIT, WE
CAN POINT OUT
THAT THEY ARE
LEGUNA AND SO

AND IF WE
MENTION
THE
FACTORS
OF 12,



RAHUR,
WHAT
SURPRISED
ONE-CHAN
WAS



DO WE
UNDERSTAND
THE "TRUE
FORM" OF THE
MULTIPLES AND
FACTORS?

THINKING
ABOUT THIS
IS REALLY
IMPRESSION,
YURI

SHINE





HA! IT'S WITH
YOU GO
SUDDENLY...

EH...

YOUR, FOOL,
WILL GO
THERE WITH
YOU!

BEHOLD,
I'M FURED
AFTER
WALKING
ALL THIS
TIME——!!



LET'S GO IN,
ONII-CHAN!!



I...
I GET IT,
I GET IT.

LET'S GO
REST A LITTLE
THAT.



WELL
THERE

CLINK



YEAH

IT'S CALLED
A PYTHAGORAS
JUICE WATER.
ONE-CHAN



BUT IT'S
DELICIOUS



TEACH
ME NOW

To-da

ONE-CHAN



THE TRUTH IS, I
WANTED TO DO IT
WHEN I WAS IN
HOSPITAL TOO.....

YOU WERE
CARRYING A
NOTEBOOK?



$$\frac{1}{6} + \frac{1}{10} = \frac{1 \times 5}{6 \times 5} + \frac{1 \times 3}{10 \times 3}$$
 Multiply with the numerator and denominator by the same number.

$$= \frac{5}{30} + \frac{3}{30}$$
 Convert to a common denominator.

$$= \frac{5+3}{30}$$
 Add the numerators together.

$$= \frac{8}{30}$$
 Added.

$$= \frac{4}{15}$$
 Simplify.

$$= \frac{4}{15}$$
 Simplified.

ISN'T IT EASY LIKE THIS, ONE-CHUNK?



ER...

WELL,

NOW THAT YOU MENTION IT, THAT'S RIGHT



WE LIST THE LEAST COMMON MULTIPLE FOR THE COMMON DENOMINATOR, AND WE USE THE GREATEST COMMON DIVISOR WHEN WE SIMPLIFY



THAT'S RIGHT. AFTER CONVERTING TO A COMMON DENOMINATOR, WE ADD THE NUMERATORS TOGETHER.

AND FINALLY WE SIMPLIFY

YEAH



gah

gah

WELL THEN, LET'S PRACTICE THE GREATEST COMMON DIVISOR AND THE LEAST COMMON MULTIPLE



Express the greatest common divisor of the natural numbers a, b as M , and their least common multiple as L . Then express $a \times b$ using M and L .



BUT I HAVEN'T
LEARNED A
FORMULA
LIKE THIS
BEFORE.

EVEN IF
YOU HAVEN'T
LEARNED THIS
FORMULA, YOU
CAN THINK
ABOUT IT.

YOU
GIVE UP SO
FAST.

THAT'S
NOT
FAST!



I DON'T
KNOW!



YUP!

THEN
HOW ABOUT
THINKING
ABOUT IT
TOGETHER?

WITH HURU'S
FULL-TIME
TEACHER.



PLEASE
LET'S PUT
THIS INTO
A TABLE.

ESPECIALLY
WHEN THERE
ARE A LOT OF
VARIABLES LIKE
 x , y , z , AND L .

WRITING
CONCRETE NUMBERS
AND THEN THINKING
IS IMPORTANT.

LET'S THINK
ABOUT THE
PROBLEMS AS
CONCRETELY
AS POSSIBLE.

LIVE TEST?

a	b	$a = b$	M	L
1	1	1	1	1

LOSER...

OKAY, LET'S TRY IT...

IN THE CASE $a=1$, $b=1$, BOTH NUMBERS ARE THE SMALLEST NATURAL NUMBERS AND THEY ARE EVEN EQUAL TO EACH OTHER.

THIS WOULD BE A VERY SPECIAL CASE

HOW ABOUT $a=18$, $b=24$ FOR EXAMPLE?

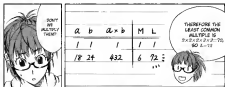
NOW LET'S TRY LARGER NUMBERS WHERE $a \neq b$ AND THAT ARE A LITTLE BIT LARGER

LIVE TEST?

I SEE YOU DECOMPOSED THEM INTO THEIR PRIME FACTORS

$$a = 18 = 2 \times 3 \times 3$$

$$b = 24 = 2 \times 2 \times 2 \times 3$$





$a =$ $2 \times 3 \times 3$
 $b = 2 \times 2 \times 2 \times 3$

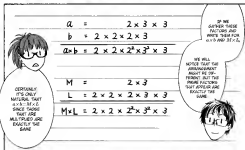
THAT'S TRUE, WE WILL TRY TO APPROXIMATE THE FACTORS FROM ABOVE TO BELOW.

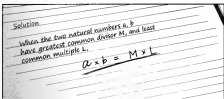
WE WILL WRITE THE DECOMPOSITION INTO PRIME FACTORS OF $a=18$, $b=24$ FROM ABOVE.

$M =$ 2×3
 $L = 2 \times 2 \times 2 \times 3 \times 3$

IN THE SAME WAY, WE WILL WRITE $M=6$, $L=72$.











THE OTHER ONE
ONE-CAN
SAY

THAT
YOU'RE A
PERSON WHO
ACCEPTS
THINGS
PROPERLY

WHOOOOW



WOULD
TEACHING YOU
FROM THEM DO
ANY "SUBSTITUTE"
OR "TAKE-UP"
STAND?

BUT THEY
REALLY SEEM
TO WANT TO
MOVE ON



IN EACH AN
EXCHANGE,
NO ONE CAN
SAY SOMETHING
LIKE "I DON'T
UNDERSTAND"



BUT

ONE-CAN
HIMSELF IS A
PERSON WHO
ACCEPTS
THINGS
PROPERLY



IS BECAUSE
BECAUSE I'M TALKING
WITH ONE-CAN. I FEEL
THAT NO MATTER WHAT
I SAY, IT WILL BE
ALRIGHT

YOU KNOW,
THE REASON I
WANT TO LEARN
FROM ONE-CAN





YOU
WANT
TO LEARN
MORE



REFUSE,

WELL
WHATEVER







WELCOME
BACK.



Why is
Minako-san in
the house...?



The greatest common divisor and the least common multiple.

The multiples of 4 in the natural numbers are 4, 8, 12, 16, 20, 24, ...
and the multiples of 6 are 6, 12, 18, 24, 30, ...

We call the intersection of the multiples of 4 and the multiples of 6 the "common multiples" of 4 and 6. The common multiples of 4 and 6 are 12, 24, 36, ...

From within the common multiples, the lowest number is called the "least common multiple". The least common multiple of 4 and 6 is 12.

Between the greatest common divisor and the least common multiple, as you said, there's an interesting relationship. When we have the two natural numbers a and b , supposing that their greatest common divisor is d , and the least common multiple is L , then $a \times b = d \times L$.

As "boku" explained, the reason for this becomes easy to understand when we try doing prime factor decomposition of a and b (decomposing to a product of their prime factors).

Prime factor decomposition is really useful when we are thinking of problems related to integers or natural numbers.



数学ガール

World's most beautiful girl proves Fermat's Last Theorem

フェルマーの最終定理